REMARKS

Favorable consideration and allowance of the claims of the present application are respectfully requested.

In the present Official Action, the Examiner rejected Claims 1-22 under 35 U.S.C. §102(e) as allegedly anticipated by Legall et al. (US 5,929,916) (hereinafter "Legall").

With respect to the rejection of Claims 1-22 under 35 U.S.C. §102(e), applicants respectfully disagree in view of the amendments provided herein.

In response, applicants have cancelled claims 1, 3 and 4 and submit a new independent Claim 23. Further, applicants have cancelled Claims 12, 14 and 15 and have added a corresponding new independent Claim 24. Furthermore, applicants have cancelled Claim 22 and have added a corresponding new independent Claim 25.

Respectfully, applicants are not conceding in this application that the originally filed Claims 1, 12 and 22, now canceled, are not patentable over the art cited by the Examiner, as the present claim amendments and cancellations are only for facilitating expeditious prosecution of this case.

Particularly, new Claims 23-25 are clearly patentable over the prior art noted by the examiner. Applicants respectfully reserve the right to pursue original filed Claims 1,12 and 22 and other claims in one or more continuations and/or divisional patent applications.

The present invention is directed to a method and system for real-time MPEG video coding with information look-ahead for constant bit rate (CBR) applications. The inventive scheme employs two MPEG encoders. The second encoder has a buffer to delay the input by an amount of time relative to the first encoder to create a look-ahead window. In encoding, the first encoder collects the information of statistics and rate-quality characteristics. An on-line information processor then uses the collected information to derive the best coding

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strategy for the second encoder to encode the incoming frames in the look-ahead window. The second encoder uses the encoding parameters from the processor as the coding guide to execute the coding strategy and generate the final bitstream.

Thus, new Claim 23 sets forth the method for real-time multi-pass encoding of a sequence of video frames comprising the steps of:

simultaneously feeding, in real-time, a sequence of incoming video frames to an input buffer and a first encoder device;

continuously collecting information, in real-time, on the statistics and rate-quality characteristics of the sequence of incoming video frames;

deriving a coding strategy to encode the sequence of incoming video frames based on the information collected;

generating coding parameters for instructing a second encoder device to encode the incoming frames according to the derived strategy; and,

encoding, by the second encoder device, the incoming frames by the derived coding strategy, wherein the input buffer implements a processing time delay of sufficient time such that sufficient information may be collected from the sequence by the first encoder device for deriving the coding strategy.(emphasis added)

Respectfully, no new matter is being entered in the new Claims 23-25 as they actually are directed to the second embodiment of the invention as depicted in Figure 3 of the present application.

The new Claims 23-25 are clearly patentably distinct from Legall.

The present invention in new Claims 23-25 is directed to real-time multi-pass encoding of signals. Legall invention is actually two embodiments: 1) one directed to a single-pass CBR video encoding technique (Legall at col. 6, lines 34-36); and 2) one directed

to a multi-pass, <u>non-real time</u> encoding scheme at variable bit rate (VBR) (at col. 6, lines 39-40 of Legall) which is antithetical to the present invention which is directed to <u>real-time, multi-pass</u> video frame encoding.

Thus, as a threshold matter, Legall does not teach or suggest a method and system of <u>real-time, multi-pass</u> video encoding as described in the present invention.

Even though the Examiner alleged that the variable bit rate encoding scheme of Legall is multi-pass and in "real time" applicants respectfully submit that the Examiner is incorrect. The only real-time scheme is in connection with a single-pass encoding scheme described in Legall in connection with the video rate encoding at CBR and shown in Fig. 7 which is a pipe-lined <u>single-pass</u> video frame encoding structure. Even Fig. 1A which appears structurally similar to the present invention is not a multi-pass encoding system. In fact, as shown in Fig. 1A, there is no input buffer acting as a delay element that would enable a first encoder/processor combination to obtain information as set forth in new Claims 23-25. The encoder buffer shown in Fig. 1A is just a transmission buffer after the video frames have been encoded. Moreover, the parallel orientation of slaves and master processing units shown in Fig. 1A is a multiplexing scheme –not a multipass encoding scheme.

While the Examiner has cited the embodiment of VBR encoding scheme as a multi-pass scheme- again, as mentioned, this embodiment of Legall is operative in non-real time. This is most clearly evident by the fact that the first pass processing for the VBR video encoding embodiment described in Legall must be completed before the next pass could be implemented. This is clearly evident in the sequence of steps described in Legall, Col. 6, line 44 - Col. 7 line 9 in connection with the description of rate control for non-real time VBR encoding. Firstly, the step (2) of Legall uses the results (i.e., a number of bits used to encode each frame in the first encoding pass) from the step (1); Secondly, the step (3) states "The

input sequence is then coded again in a second pass ..."; Thirdly, the fact that there is no input buffer before any encoder in Fig. 1A and Fig. 7A of Legall means that these steps must be executed sequentially step after step; Finally the flowchart in Fig. 8 of Legall also shows that the second pass is following the first pass. All of the foregoing clearly show that Legall's method and system of multipass encoding is not in real-time because the first pass has to be completed before the second pass can even start. Thus, Legall teaches away from a real-time, multi-pass encoding scheme and can not anticpate the present invention as now set forth in new Claims 23-25.

Thus, respectfully, the Examiner is respectfully requested to enter and consider the new Claims 23-25, and, in light of the distinctions described in the above remarks, to allow these claims to proceed to issuance, which action is respectfully solicited.

In view of the foregoing, this application is now believed to be in condition for allowance, and a Notice of Allowance is respectfully requested. If the Examiner believes a telephone conference might expedite prosecution of this case, it is respectfully requested that he call applicant's attorney at (516) 742-4343.

Respectfully submitted,

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